

Transcript for the Plant Virology course, week 3 part 1

3. 1. (00:10 00:35) Welcome on the part one of the “Plant Virology” course entitled “Disease symptoms caused by plant viruses”.

Disease caused by plant viruses are called viroses. The branch of phytopathology concerned with the study and classification of the symptoms of plant diseases is called symptomatology

3.2. (00:35 01:04) The first appearance of disease symptoms on the host, after infection and incubation periods, begins the third stage of the viral pathogenesis.

External disease symptoms caused by plant viruses could be visible on many organs of infected plant: leaves, stems, flowers, roods and fruits. **Internal symptoms** are restricted to infected tissues (e.g., necrosis of phloem tissue) or they could be examined by electron microscopic techniques as the specific cytological alternations.

3.3. (01:04 01:26) Plant viruses could cause **local symptoms** on infected plants – small spots are usually restricted to the side of infections (hypersensitivity of infected cells). Local spots on the indicator plants are used in bioassay tests

3.4. (01:26 01:37) Mostly **systemic viral symptoms** are observed as the entire plant harbor the virus pathogens.

3.5. (01:37 01:47) Almost all plant viruses caused more or less visible reduction of growth, vigor and reduction of development of plants.

3.6. (01:47 02:01) Dwarfing, stunting or internode shortening – it is subnormal size of infected plant or some of its organs

3.7. (02:01 02:10) Chrysanthemum plant infected with Chrysanthemum stunt viroid (red arrow)

3.8. (02:10 02:21) Reduction in the size of leaves (potato) and other organs:

3.9. (02:21 02:24) Reduction in the size of flower (gerbera)

3.10. (02:24 02:27) Flower growth reduction (cucumber)

3.11. (02:27 02:30) Reduction in the size of fruits (tomato)

3.12. (02:30 02:37) Different color deviations are typical and common symptoms for this kind of diseases

3.13. (02:37 02:50) Among them are **mosaics** – very characteristic pattern of light green and dark green areas of various shape and sizes on the leaves

3.14. (02:50 02:56) Discoloration spotting, flecking - an abnormal pattern of coloration on apple red skin

3.15. (02:56 03:08) Striping or streaking symptoms could be observed on infected leaves (mainly monocots)

- 3.16. (03:08 03:25) Narrow, elongate with white or yellow area streaks on lower leaves as the result of infection by one virus and stripes and patches on upper leaves as the result of infection by a complex of viruses (symptoms synergism).
- 3.17. (03:25 03:34) Vein mosaics, yellow vein mosaics, vein yellowing – discoloration of the tissue closely adjacent to the veins. Green color disappear.
- 3.18. (03:34 03:40) Irregular mosaic along veins
- 3.19. (03:40 03:47) Sometimes disease symptoms are limited to only part of the infected organ
- 3.20. (03:47 03:57) This type of vein yellowing symptoms is called “net”
- 3.21. (03:57 04:04) Vein banding or green vein banding – this type of symptoms are in contrast to vein mosaics or vein yellowing symptoms because:
- 3.22. (04:04 04:16) The regions along the leaf veins remain green.....
- 3.23. (04:16 04:22) and the rest of the leaf tissue becomes yellow
- 3.24. (04:22 04:34) Color breaking or mottling – small but numerous areas of discoloration occur on infected leaves or flowers
- 3.25. (04:34 04:48) Flower breaking symptom caused by Tulip breaking virus appears as irregular streaks, flame pattern or fine feathering on the petals. Yellow background is visible.
- 3.26. (04:48 04:51) The mottling on the petals (light breaking) is an effect of underproduction of red pigments. White background is visible
- 3.27. (04:51 05:06) Overproduction of anthocyanins results in small dark streaks or elongated flecks on petals (dark breaking)
- 3.28. (05:06 05:11) Strong accumulation of red pigments in the upper epidermal layer of petals (dark breaking)
- 3.29. (05:11 05:27) Both type of disease symptoms can occur simultaneously on one plant. Virus infected tulips are no longer available commercially.
- 3.30. (05:27 05:40) The end of part one. Thank you for the attention and I invite you to the part two of this week.